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Global Interoperability of Broadband Networks (GIBN) Project Overview

Satellite Networks and Architectures
Workshop
Cleveland, Ohio

*Dr. Ramon P. De Paula
NASA HQ
Washington DC

U.S. Vision for the GII

"Let us build a global community in which the people of neighboring countries view each other not as potential enemies, but as potential partners, as members of the same family in the vast, increasingly interconnected human family."

Vice President Al Gore at the First World Tele-communication Development Conference in March 1994.



Global Information Infrastructure (GII)

What is the GII?

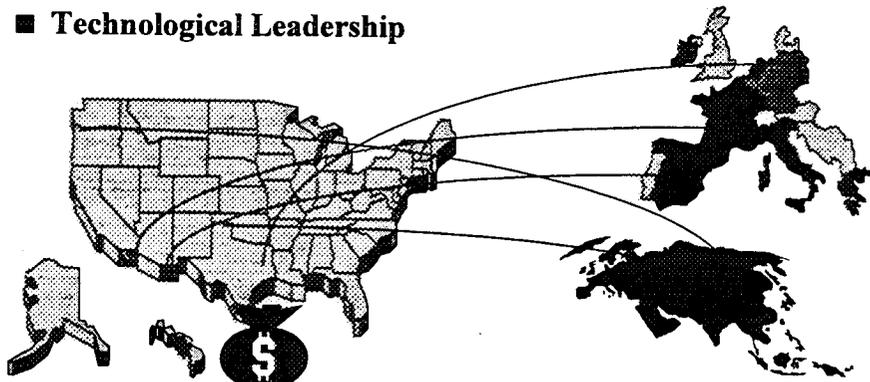
The term GII was defined at the February 1995 meeting of the G7 nations, not by what it is (or will be), but by what it will enable:

"THE GII WILL ALLOW READY ACCESS TO RELEVANT INFORMATION AT REASONABLE COST, BY ANYONE, ANYWHERE, AT ANY TIME"

GII as a whole is worldwide "network of networks" which will create a global information marketplace, encouraging broad-based social discourse within and among all countries.

GII Benefits to the U.S. Economy

- Direct and Indirect Employment Benefits
- Exports (Positive Trade Balance)
- Technological Leadership



G-8 "Global Information Society" Projects

1. Global Inventory
2. Global Interoperability of Broadband Networks (GIBN)
3. Cross-Cultural Education and Training
4. Electronic Libraries
5. Electronic Museums and Galleries
6. Environment and Natural Resources Management
7. Global Emergency Management
8. Global Healthcare Applications
9. Government On-line
10. Global Marketplace for Small and Medium Enterprises
11. Maritime Information Systems

Global Interoperability for Broadband Networks (GIBN) Mission

US Perspective:

- Establish strong Government, industry and academia partnerships.
- Formulate clear objectives for experimentation.
- Emphasis that US Industry is an important partner.
- Foster International cooperation with non-US government agencies, universities and industry partners

Global Interoperability for Broadband Networks (GIBN): "Principles"

- To establish experimental intercontinental communications links among the three main geographic areas of the G-8 countries: North America, Europe and Japan.
- To provide a common testbed for the promotion of joint Satcom/Terrestrial Interoperable R&D, demonstrations and pre-commercial trials of advanced high data rate (>45 MBPS) services and applications.
- To encourage research initiatives promoting science, education and commerce, as well as, social and cultural development.
- To develop advanced interoperable communications & information systems and networks that support emerging G8 information society applications
- The GIBN will be the interoperable testbed for the other 10 information society projects.

Global Interoperability for Broadband Networks: "Objectives and Goals"

- To promote the role of satellites in the Global Information Infrastructure (GII).
- To analyze the barriers of seamless interoperability between satellite and terrestrial communications systems; promote networks and system modifications to software or hardware to overcome such barriers.
- To integrate US industry products and services as an essential part of applications/demonstrations.
- Recommend changes in standards, where appropriate, to overcome barriers of interoperability between satellites and terrestrial systems.
- Extend connectivity of networks to non G-8 countries

Global Interoperability for Broadband Networks: "Background"

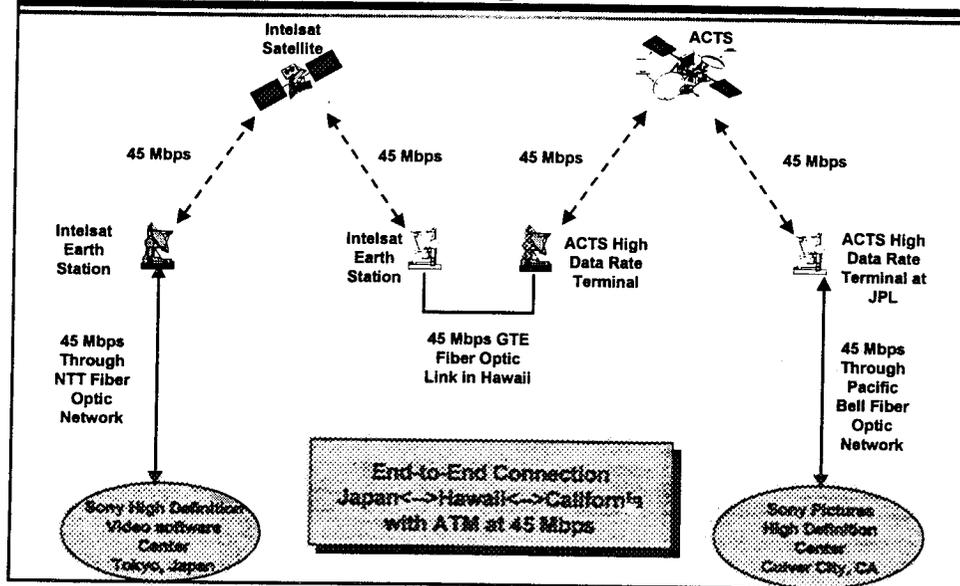
- The White House National Economic Council, invited NASA to formally participate in planning and co-coordinate jointly with NSF the U.S. contribution to the G7 GIBN project.
 - * "...the series of Trans-Pacific experiments, and others planned for the Atlantic and Asia-Europe regions, will make a very significant contribution to the G-7 Global Interoperability for Broadband Networks project."
- NASA tasked to undertake planning to support and promote additional Trans-Pacific and Trans-Atlantic GIBN experiments which provide satellite connectivity to NREN and STAR TAP.
- Applications, such as, digital libraries, telemedicine, tele-education, and electronic commerce; that contribute to NGI design and implementation were considered solid candidates for future GIBN contributions.

* Thomas A. Kalil, Senior Director, National Economic Council, The White House

Global Interoperability for Broadband Networks: "NASA Status"

- NASA LeRC Space Communications Program assigned to lead GIBN projects. Participation by JPL, GSFC, and ARC.
- Successfully completed the first Trans-pacific satellite post-production video experiment and demonstration (March /April 1997, JPL - CRL)
- Assessment of the "Science, Technology and Research-Transit Access Point" (STAR TAP) site (at Univ. of Ill.--Chicago) for installation of satellite ground terminal.
- LeRC will host Intelsat compatible Ku-band satellite terminal; scheduled for completion in September 1998.
- Three GIBN project applications currently in works; they are: Radio-Astronomy (Trans-Pacific) [JPL]; Digital Libraries (Trans-Pacific) [GSFC]; and Operation Smile (Trans-Atlantic) [GWU].
- European Commission (EC) interested to establish connectivity with US via satellite. Several other candidate for Trans-Atlantic experiment under review.

Transpacific High Definition Video Experiment



Global Interoperability for Broadband Networks: "Experiment Selection Criteria"

- Information exchange with Trans-Atlantic or Pacific partners; not just NASA's demonstration.
- Opportunity for U.S. Industry to contribute hardware, software, intellectual resources and learn about interoperability issues.
- Develop and demonstrate state-of-the-art, unique communications systems, networks and applications.
- Foster ground-breaking use of communications activities in particular wireless.
- Encourage/seek-out NASA mission tie-in.
- Promote connectivity to non G-8 countries via Satellite

Global Interoperability for Broadband Networks: "Satellite Industry Involvement"

- SITF Requirements are:
 - » Seamless interoperability between terrestrial and satellite networks which is a major problem in providing emerging broadband services to the end users
 - » In-Space Technology demonstrations are required for timely utilization of advance technologies in future communications satellite systems and applications.
 - In systems...A series of interoperability demonstrations are needed to achieve integration of satellite and terrestrial networks.

Global Interoperability for Broadband Networks: "Current Experiments"

Trans-Pacific Radio-Astronomy [JPL, CRL/MPT]

- Justification:
 - » Science and Education: Interactive image transmission from telescopes in the U.S. and Japan.
 - » builds on the successful Trans-Pacific HDTV demonstration;
 - » potential to demonstrate OC-3 [155Mbps] data rates over commercial satellite.
- Schedule:
 - » Demonstration planned for 4th Quarter FY98;
 - » Virtual Internet Testbed simulations and Final Report, 1st & 2nd Quarters FY99

Global Interoperability for Broadband Networks **Current Experiments**[continued]

Operation Smile--Telemedicine [GWU]

» **Justification:**

- Trans-Atlantic experiment;
- Global Multicast Internet Distribution
- High level of G-8 telemedicine involvement; positive exposure.

» **Schedule:**

- » 3rd or 4th Quarter FY98

Trans-Pacific Digital Library Experiment [GSFC/JPL]

» **Justification:**

- builds on the successful Trans-Pacific HDTV demonstration;
- demonstrates one of the G-7 project theme of Electronic Libraries;

» **Schedule (tentative):**

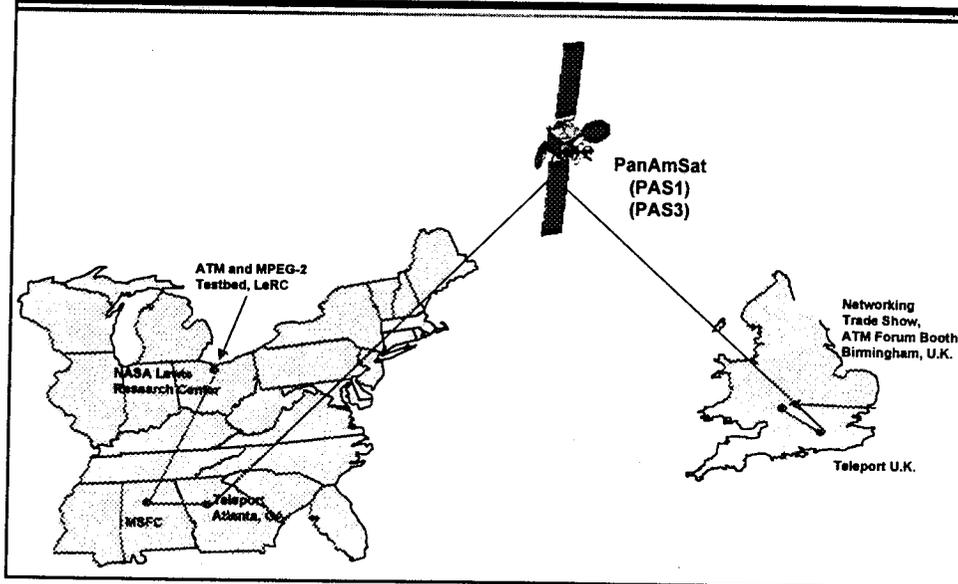
- 1st demonstration in late CY98

Global Interoperability for Broadband Networks: "Current Experiments"[continued]

Trans-Atlantic GIBN Experiment over PanAmSat:

- » Networking Trade Show, 22-25 June 1998, at Birmingham, England
- » ATM Forum sponsoring booth to present ATM related technologies
- » Offered to highlight NASA ATM over Satellite and ATM Forum work
- » ATM over Satellite Technologies / Quality of Service Video presentation MPEG2
- » During LeRC Conference, several short (5 mins) lectures by Industry leaders will be recorded; then presented at the trade show via the broadband network.
- » Voice over IP over ATM
- » PanAmSat, MetroData and NASA have partnered to present ATM Technologies Demonstrations over PanAmSat link.

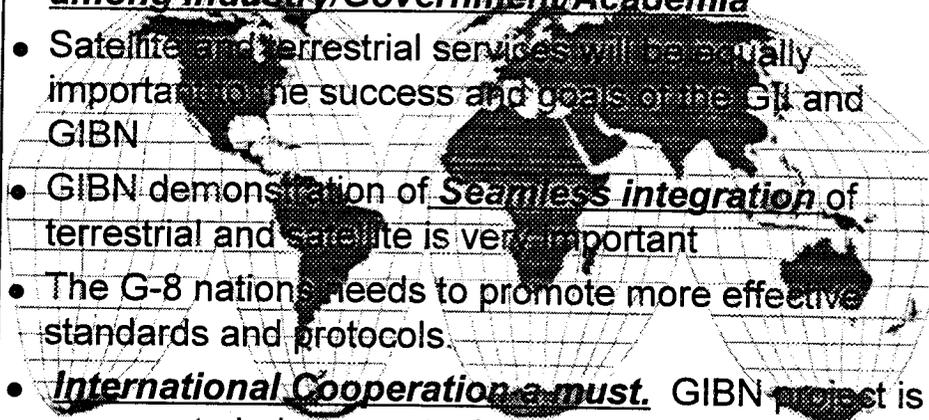
Trans-Atlantic Interoperability Broadband Network Experiment over PanAmSat



Challenge for GIBN Project

- We must view each other as potential partners
 - » Part of the GII Vision
- Eliminate bureaucratic barriers
- Realize that Satellite Systems are a Global Business
- Realize that Satellites offers unique opportunities to many nations
- Provide open access to the network for all information providers and users
- Develop unique demonstrations that address critical issues

Conclusion

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- To achieve the full potential of the future GII it will require concerted efforts and ***strong partnership among Industry/Government/Academia***
 - Satellite and terrestrial services will be equally important to the success and goals of the GII and GIBN
 - GIBN demonstration of ***Seamless integration*** of terrestrial and satellite is very important
 - The G-8 nations needs to promote more effective standards and protocols.
 - ***International Cooperation a must.*** GIBN project is one way to help promote this cooperation